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ABSTRACT

The use of magnitude estimation scaling (MES) was investigated to clarify educational priorities and to ascertain the commonality of desired educational outcomes in three Washington communities. One item from a set of 50 outcome statements was selected as the referent, and participants in several communities compared the remaining items to it, assigning a value to each item in terms of its relative importance. The field test supported the feasibility of MES for clarifying priorities. A wide range of geometric means and a clear ranking of items were obtained for decision-making purposes. The ordering of objective areas demonstrated commonality among the communities surveyed and with other studies. (Author)

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USING MAGNITUDE ESTIMATION SCALING

TO COMPARE PRIORITIES

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This study had two purposes. In general, it attempted to investigate the feasibility of using a magnitude estimation scaling (MES) procedure to clarify educational priorities in small school districts. Specifically, however, the MES responses of participants in three Washington communities were compared to determine the commonality of desired educational outcomes and the predictive value of the items. The study was conducted by the Program Evaluation and Research Section of the Washington Superintendent of Public Instruction with the assistance of Educational Service District 114.

Magnitude estimation scaling is defined as a process which substitutes each participant's determination of item values for the more popularly used fixed category scales. Instead of indicating item priorities in terms of one of a set of categories, for example, one of five, the participant is requested to assign values to each of the survey items in relation to a selected referent point. In many studies the referent item has been given a value of 50, and participants instructed to compare each of the remaining items to this. If an item is thought to be twice as important as the referent it is rated 100, five times as important 250, half as important 25. The geometric mean is used as the measure of central tendency and as the basis for statistical analysis.

The activities reported in this paper build on three previous efforts: a pilot study conducted at the Stanford Research Institute (Dell and Meeland, 1973) which compared the responses of a group using a fixed category scale to those of a group using MES; a MES assessment of needs for a California elementary school (Monta Loma, 1974); and an investigation using MES in small Washington school districts to determine the desirability of selected educational outcomes (Rasp, 1975). The survey items used in these studies were nearly identical with most adapted from a collection of outcome statements developed by the Center for the Study of Evaluation at the University of California, Los Angeles.

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M005 329

In the present investigation fifty survey items were prepared as sets of cards. Following the common lead phrase, "Upon completion of elementary school (6th grade) it is desirable that as a result of school most children..." each card contained a statement of an outcome defined by examples. One item from the survey was selected randomly and assigned the value of 50. Participants were instructed to compare the remaining items to this referent and to assign values in terms of relative importance. A listing of the items in an abridged form is included on page four.

Three school districts located in rural/suburban areas along the northern coast of the Olympic Peninsula in Washington participated in the study. The districts ranged in size from approximately 130 to 1,650 students. After the MES process and materials were reviewed in a joint meeting, local advisory committees were formed with responsibility: for coordinating the district-wide efforts, for selecting the participant population, for distributing and collecting the survey cards, and for reporting information to their communities. The completed survey packets were sent to the state office for tabulation. At that time the responses were key punched for computer processing and the geometric mean for each item was calculated. The results of the survey were analyzed, arranged for public display, and returned to the local districts. The geometric means are included on page four.

The responses for the survey items in the three districts approached congruence. When the items were ordered based on the magnitude of the geometric means, all three districts shared ten common items or 83 percent in the upper quartile and twelve common items or 92 percent in the lower quartile. In addition, since the survey items represent eleven areas of elementary educational objectives, the arithmetic means of the geometric means for the items subsumed by each objective were calculated. The plotting of these means resulted in a nearly identical rank ordering display. In comparing the three Washington communities with the experience of the Monta Loma School in California, the rank order pattern was again reinforced. This data is presented on page five. To study the statistical significance of the differences in the rankings by the Washington communities, a Friedman two-way analysis of variance by ranks was conducted on the ordering of the geometric means for each item. With two degrees of freedom, the Friedman value of .21 indicated that the priorities established independently by the three communities were not significantly different and that differences as great as those observed could be expected 90% of the time based on chance alone.

The results of the community priority surveys, as in other studies, speak well to the practicability of the items and process. The local advisory committees testified to the ease of logistical operations. The participants were clearly able to "estimate magnitude." The composite of responses did generate a wide range of geometric means and a clear rank ordering of items. The information was reported as being useful for decision-making purposes.

References

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MAGNITUDE ESTIMATION SCALING ITEMS
IN ABRIDGED FORM WITH GEOMETRIC MEANS

Upon completion of elementary school (6th grade) it is desirable that as a result of school most children:

Crescent Fairview Sequim

1. Know and practice health and safety.....	50	50	50
2. Have a positive attitude toward school and teachers.....	116	173	105
3. Show a desire to achieve.....	133	173	124
4. Have an appreciation for reading.....	255	229	141
5. Know about economics.....	72	61	57
6. Like arts and crafts.....	38	43	43
7. Know about physical education.....	74	98	63
8. Perform some form of music arts.....	60	78	57
9. Make art and craft objects.....	54	56	49
10. Know about political science.....	125	83	79
11. Have developed interests outside of school.....	78	89	99
12. Have developed a sense of sportsmanship.....	173	144	143
13. Have a general positive attitude toward themselves.....	254	213	187
14. Have healthy social attitudes.....	227	173	172
15. Know a foreign language.....	36	24	30
16. Have begun to understand philosophies.....	68	56	57
17. Know about religions.....	73	48	49
18. Know about anthropology.....	38	40	39
19. Know about sociology.....	59	47	56
20. Know facts about history.....	86	99	68
21. Know something about foreign languages.....	47	40	42
22. Know about drugs.....	121	117	99
23. Know about psychology.....	61	43	59
24. Have developed good study skills.....	212	222	163
25. Have a healthy personal temperament.....	166	144	153
26. Know the basic ideas of mathematics.....	240	180	136
27. Know how to do basic arithmetic problems.....	307	302	216
28. Know how to read.....	397	342	242
29. Be able to use mathematics.....	356	264	178
30. Can interpret what they read.....	345	283	202
31. Can understand what they read.....	383	300	209
32. Know how to write well.....	323	257	194
33. Speak so that others can understand them.....	253	202	183
34. Know something about the physical sciences.....	96	81	71
35. Be able to listen.....	276	242	189
36. Know and use language correctly.....	232	222	155
37. Know about geography.....	146	136	101
38. Be able to make judgments.....	136	139	148
39. Can put information together.....	144	154	131
40. Know many facts or ideas.....	87	127	80
41. Can break down information.....	108	138	83
42. Have an understanding of what they learned.....	157	178	141
43. Can apply what they have learned.....	167	177	165
44. Have a general idea of the use of history.....	82	100	93
45. Know something about biology.....	88	82	81
46. Know about ecology.....	96	68	105
47. Enjoy and appreciate music.....	81	59	79
48. Understand arts and crafts.....	55	53	58
49. Know something about the earth sciences.....	104	110	84
50. Have some knowledge of family life education.....	90	64	108

ARITHMETIC MEANS OF ITEM GEOMETRIC MEANS

GEOMETRIC MEANS

350

300

250

200

150

100

50

0

ITEM AREAS

- Foreign Language

- Arts and Crafts

- Music

- Social Studies

- Physical Education

- Science

- Cognitive

- Affective

- Language Arts

- Mathematics

- Reading

- ▲ Crescent School District (Washington)
- Fairview School District (Washington)
- Monta Loma School (California)
- Sequim School District (Washington)

6